

TOPIC 6. Differential calculus of functions of many variables. Application of the gradient vector in the linear model of international trade. Integral calculus of functions of one variable

ТЕМА 6. Диференціальне числення функцій багатьох змінних. Застосування вектора градієнта в лінійній моделі міжнародної торгівлі. Інтегральне числення функцій однієї змінної

1. Functions of two variables.
2. The domain of their definition.
3. Partial derivatives. Mixed derivatives.
4. The differential.
5. The necessary conditions of the function of two variables.
6. The sufficient conditions of the extremum of the function of two variables.
7. The notion of the conditional extremum.
8. The method of Lagrange factors.
9. The least-squares method.
10. The function of several variables in the problems of economics (the utility function, the expenditure function, the multifactor production function of Cobb and Douglas).
11. An antiderivative.
12. An indefinite integral.
13. A table of basic integrals.
14. Direct integration.
15. A change of the variable in an indefinite integral.
16. Integration by parts.
17. Integration of rational fractions.
18. Integration of irrational expressions and expressions which have trigonometric functions.
19. The notion of the definite integral.
20. Integral sums.
21. Properties of the definite integral.
22. Newton–Leibnitz formula.
23. A change of the variable in a definite integral.
24. Integration by parts.
25. The notion of an improper integral.
26. The conditions of the convergence of improper integrals.
27. Euler-Poisson integral.

28. Calculation of areas, volumes of the solid of a rotation.
29. Calculation of the arc lengths of curves.
30. Formulas of rectangles, trapezoids, Simpson.
31. The volume of the productive production.
32. A consumer surplus.
33. Lorenz curve.